

### Trend Study 21-13-03

Study site name: Walker Creek.

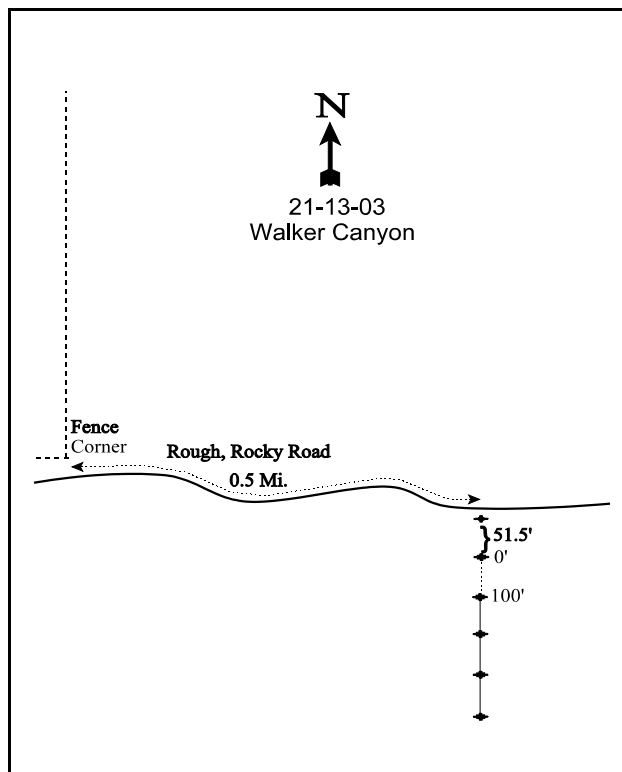
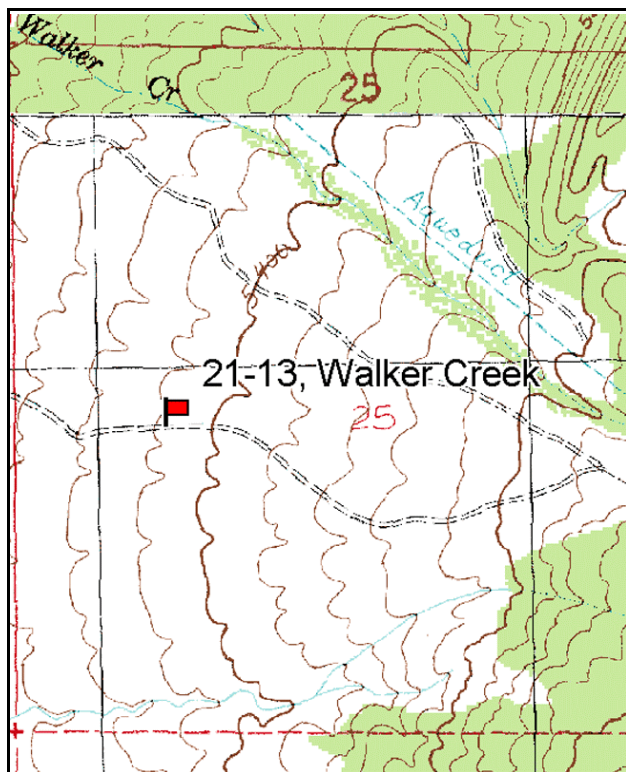
Vegetation type: Chained P-J.

Compass bearing: frequency baseline 180 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Rebar: belt 2 on 3ft, belt 3 on 6ft, belt 4 on 1ft, and belt 5 on 6ft.

### LOCATION DESCRIPTION

Go south from Meadow (southwest of Fillmore) on SR 133 to mile marker 6. Go approximately 0.05 miles further south on SR 133 and turn east on a gravel road. Go east 0.8 miles to a junction. Turn right and follow this road for 1 mile around several bends until the main road turns back to the south. Instead of turning south, continue straight east for 0.1 miles to a fork. Keep right and go 0.15 miles to a concrete aqueduct. Continue on the road 0.25 miles to a fence corner on the left, and travel another 0.5 miles to a cairn on the right side of the road. The 0-foot baseline stake is 51.5 feet south of the rebar and rock cairn. The 0-foot stake is a 2 ½ foot tall rebar tagged #7074. A 4X4 vehicle is advisable for the rough roads.



Map Name: Fillmore

Diagrammatic Sketch

Township 22S, Range 24W, Section 17

GPS: NAD 27, UTM 12S 4302863 N, 381152 E

## DISCUSSION

### Walker Creek - Trend Study No. 21-13

The Walker Creek trend study is located on the gentle slopes below the Pahvant Range southeast of Meadow. The area is rather flat (0-3% slope to the west) at an elevation of 5,400 feet. Small intermittent draws in this area drain to the west. In 1966, about 270 acres in the Walker Creek area (BLM) were treated by dozing out individual junipers and leaving all other desirable browse species. The project was done primarily to benefit wildlife. Grazing was permitted in the past, but the area received very little cattle use. There was no evidence of livestock use in either 1998 or 2003 on this study. Wildlife pellet groups were abundant and well distributed throughout the area in 1985. Pellet group data from 1991 indicated a moderately high level of use at 100 deer days use/acre (247 ddu/ha). In addition, 2 deer carcasses were found on the site. A pellet group transect read parallel to the sampling baseline estimated 94 deer days use/acre (232 ddu/ha) and 124 deer days use/acre (306 ddu/ha) in 1998 and 2003 respectively. Most of the pellet groups in both years were from winter use. Resting and escape cover is widely available. Water is available in Meadow Creek about one-half mile to the north.

Soils have moderate depth with an effective rooting depth of almost 12 inches. Soil depth measurements were restricted by numerous rocks within the profile. Parent material is primarily from sandstone but some granite was found on the site. Soils are slightly acidic (pH of 6.4) and sandy clay loam in texture. Vegetation and litter cover are abundant, with bare soil understandably low. Erosion is minimal even in the small gullies around the area due to the abundant vegetation and litter cover. Unfortunately, most of this protective cover comes from cheatgrass. A soil condition class assessment completed in 2003 rated soils as stable. In 2003, average soil temperature was rather high at 80°F indicating a very dry soil profile.

The key browse species are basin big sagebrush and Stansbury cliffrose. Although all the big sagebrush on the site was classified as basin big sagebrush, some of the plants are hybrids with mountain big sagebrush as determined from a black light test. Big sagebrush density was estimated at 2,560 plants/acre in 1998 and 2,060 in 2003. Basin big sagebrush contributed 55% and 64% of the total browse cover on the site in 1998 and 2003 respectively. Percent decadence was estimated at 32% in 2003, up from 22% in 1998. Use increased to a more moderate level in 2003, but very few plants were heavily hedged. The majority of big sagebrush plants have displayed normal vigor in all surveys. Young plants were moderately abundant in 1985 and 1991, but have since declined to make up only 2% of the population in 1998 and none were sampled in 2003. Low reproduction is primarily the result of cheatgrass abundance in the understory which provides intense competition for seedling and young sagebrush to establish. This condition is exacerbated by extended bouts of low precipitation. Basin big sagebrush annual leaders averaged 1.3 inches of growth when the site was sampled in June 2003.

The Stansbury cliffrose population is stable averaging about 500 plants/acre since 1985. The cliffrose population had low decadence, normal vigor, and good recruitment in 1985 and 1991. Use in those years was mostly moderate. In 1998, cliffrose had reduced recruitment and the population was mostly mature. In 2003, percent decadence rose sharply to 46%, and half of the population showed heavy use. The cliffrose population has steadily increased in size with mature plants averaging 5 feet in height and 6 feet in width in 1998 and 2003. Plants are becoming less available to browsing animals due to height. The cliffrose is quite bushy, which could indicate some crossing with bitterbrush on the site. Cliffrose leaders averaged 3.4 inches of growth in June 2003.

Point quarter data from 2003 estimated 95 juniper trees/acre with an average trunk diameter of over 4 inches. Data from the old density plots estimated a much higher density of juniper at 800 plants/acre in 1985 and 999 in 1991. These estimates were made with 3, small .01 acre circular plots which do not adequately sample shrub or tree populations.

The herbaceous understory, like many of the sites within the Fillmore unit, is dominated by cheatgrass and annual forbs. Cheatgrass contributed 89% of the grass cover in 1998, but only 49% in 2003. A significant decline in cheatgrass cover and nested frequency in 2003 also occurred on most of the other sites within the unit, likely the result of drier than normal spring precipitation. However, cheatgrass remains abundant enough to pose a serious fire hazard to this area. Perennial grasses are uncommon with the exception of Sandberg bluegrass which has steadily increased over the years. Sandberg bluegrass significantly increased in nested frequency in 2003, while average cover for this species quadrupled. Although Sandberg bluegrass plants are relatively small, this increase is positive for the understory. Other perennial grasses sampled on the site include crested wheatgrass, bluebunch wheatgrass, and bottlebrush squirreltail. The forb component is sparse and has poor composition as annuals are the most abundant.

#### 1985 APPARENT TREND ASSESSMENT

Soils appear to be stable with low levels of erosion. The key browse species, big sagebrush and cliffrose, appear to be stable. However, the lack of desirable grasses and forbs and the encroachment of junipers and broom snakeweed would indicate a slow downward trend. Another juniper treatment followed by seeding with a mix of perennial grasses and forbs may be warranted in the future.

#### 1991 TREND ASSESSMENT

Soil trend appears stable but in poor condition because of very low value for basal vegetation cover. Bare ground is only moderate at 18%. Key browse for the site are basin big sagebrush and Stansbury cliffrose. The sagebrush population has a stable density, a slight decline in percent decadence, and use decreased somewhat. The cliffrose population is stable with slight increases in percent decadence and utilization. Broom snakeweed has increased in density by 30%. Trend for browse is stable. The herbaceous understory is very similar to the other sites in unit 21, having very few perennial species. Sandberg bluegrass is the only common species and it is a small plant which provides little amounts of useful forage. Trend is stable, but poor because of the overabundance of increaser species.

##### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

#### 1998 TREND ASSESSMENT

Trend for soil is up due to a decline in percent bare soil from 18% to 4%. Litter cover has also increased. This change is primarily due to the vigorous stand of cheatgrass in the understory which provides half of the vegetation cover on the site and poses a significant fire hazard. Trend for the key browse species, basin big sagebrush and cliffrose is stable. Population densities are up slightly, but some of the difference may be due to the much larger sample used in 1998. Both populations are becoming increasingly mature, but vigor is currently good and percent decadence has declined. Heavy use has also declined since 1991. However, this stable trend is precarious due to the decline in the proportion of young plants in the population for both sagebrush and cliffrose. Some seedlings were found for cliffrose in 1998, however no sagebrush seedlings have been sampled since 1985. This is mostly due to the vigorous stand of cheatgrass which provides intense competition to the establishment of sagebrush seedlings. Without more recruitment in the future, these shrub populations will eventually decline. Another factor is the fire hazard posed by the abundant cheatgrass understory. It is not a question of if a fire will occur on this site but when. A fire would devastate the sagebrush and cliffrose on the site and eliminate this area as important deer winter range for many, many years. Trend for the herbaceous understory is up slightly due to an increase in the sum of nested frequency for perennial grasses and forbs. However, they are both still deficient and cheatgrass continues to dominate.

### TREND ASSESSMENT

soil - up (5)

browse - stable (3)

herbaceous understory - up slightly (4)

### 2003 TREND ASSESSMENT

Soils have a stable trend. Bare soil remains very low (6%), and vegetation and litter cover are abundant and effectively limit erosion. Trend for browse is slightly down. Basin big sagebrush and cliffrose both show slight declines in density, increases in decadence, and increased use. There are no young sagebrush in the population, and due to the abundance of cheatgrass and other annuals in the understory, sagebrush will have a difficult time increasing in population density in the future. Trend for the herbaceous understory is slightly up due to a significant increase in Sandberg bluegrass frequency. Cheatgrass also significantly declined in nested frequency, but this species remains abundant and still poses a fire hazard on the site.

### TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - slightly up (4)

### HERBACEOUS TRENDS --

Management unit 21 , Study no: 13

T y p e	Species	Nested Frequency				Average Cover %	
		'85	'91	'98	'03	'98	'03
G	Agropyron cristatum	<sub>a</sub> 1	<sub>a</sub> 2	<sub>b</sub> 17	<sub>ab</sub> 10	.80	.22
G	Agropyron spicatum	-	-	1	4	.00	.15
G	Aristida purpurea	4	1	1	10	.15	.83
G	Bromus tectorum (a)	-	-	<sub>b</sub> 374	<sub>a</sub> 287	32.18	10.02
G	Poa secunda	<sub>a</sub> 74	<sub>ab</sub> 101	<sub>b</sub> 111	<sub>c</sub> 229	2.03	8.33
G	Sitanion hystrix	<sub>a</sub> 3	<sub>a</sub> 7	<sub>b</sub> 42	<sub>b</sub> 40	.72	.89
G	Vulpia octoflora (a)	-	-	<sub>b</sub> 29	<sub>a</sub> 1	.46	.00
Total for Annual Grasses		0	0	403	288	32.64	10.03
Total for Perennial Grasses		82	111	172	293	3.71	10.43
Total for Grasses		82	111	575	581	36.36	20.47
F	Alyssum alyssoides (a)	-	-	2	2	.00	.00
F	Asclepias asperula	2	-	-	-	-	-
F	Collinsia parviflora (a)	-	-	24	44	.08	1.52
F	Draba spp. (a)	-	-	14	-	.03	-
F	Eriogonum cernuum (a)	-	-	-	3	-	.15
F	Erodium cicutarium (a)	-	-	<sub>a</sub> 1	<sub>b</sub> 34	.03	.94
F	Eriogonum racemosum	2	-	-	-	-	-
F	Helianthus annuus (a)	2	-	-	-	-	-

Type	Species	Nested Frequency				Average Cover %	
		'85	'91	'98	'03	'98	'03
F	Holosteum umbellatum (a)	-	-	19	30	.06	.07
F	Lactuca serriola	-	-	2	-	.00	-
F	Microsteris gracilis (a)	-	-	<sub>b</sub> 38	<sub>a</sub> 5	.14	.01
F	Phlox longifolia	-	-	8	-	.07	-
F	Ranunculus testiculatus (a)	-	-	18	10	.08	.02
F	Zigadenus paniculatus	6	1	7	5	.07	.02
Total for Annual Forbs		2	0	116	128	0.44	2.74
Total for Perennial Forbs		10	1	17	5	0.14	0.01
Total for Forbs		12	1	133	133	0.58	2.75

Values with different subscript letters are significantly different at alpha = 0.10

#### BROWSE TRENDS --

Management unit 21 , Study no: 13

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia tridentata tridentata	78	63	15.96	18.90
B	Cowania mexicana stansburiana	27	24	7.35	3.42
B	Gutierrezia sarothrae	35	7	1.35	.30
B	Juniperus osteosperma	4	5	4.09	6.76
B	Opuntia spp.	2	0	.30	-
B	Purshia tridentata	0	1	-	-
Total for Browse		146	100	29.06	29.39

#### CANOPY COVER, LINE INTERCEPT --

Management unit 21 , Study no: 13

Species	Percent Cover	
	'98	'03
Artemisia tridentata tridentata	-	19.63
Cowania mexicana stansburiana	-	5.98
Gutierrezia sarothrae	-	.65
Juniperus osteosperma	4.19	8.46
Purshia tridentata	-	.08

KEY BROWSE ANNUAL LEADER GROWTH --  
Management unit 21 , Study no: 13

Species	Average leader growth (in)
	'03
Artemisia tridentata tridentata	1.3
Cowania mexicana stansburiana	3.4

POINT-QUARTER TREE DATA --  
Management unit 21 , Study no: 13

Species	Trees per Acre		Average diameter (in)	
	'98	'03	'98	'03
Juniperus osteosperma	145	95	2.9	4.2

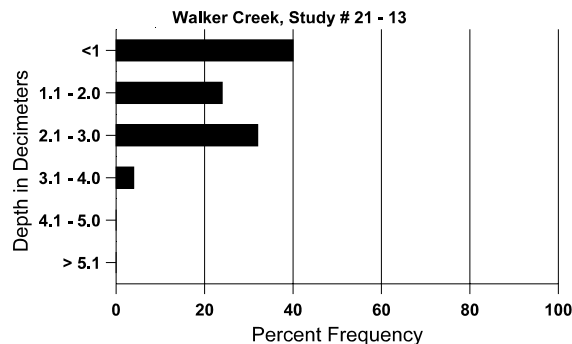
BASIC COVER --  
Management unit 21 , Study no: 13

Cover Type	Average Cover %			
	'85	'91	'98	'03
Vegetation	1.75	1.00	58.23	54.36
Rock	7.50	12.25	13.37	15.63
Pavement	3.75	4.25	3.85	2.12
Litter	65.50	64.50	70.77	46.40
Cryptogams	0	0	.69	.00
Bare Ground	21.50	18.00	3.53	5.86

SOIL ANALYSIS DATA --  
Management unit 21, Study no: 13, Study Name: Walker Creek

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
11.5	80.5 (7.0)	6.4	60.0	17.4	22.6	2.5	9.0	108.8	0.9

## Stoniness Index



PELLET GROUP DATA --

Management unit 21 , Study no: 13

Type	Quadrat Frequency		Days use per acre (ha)	
	'98	'03	'98	'03
Rabbit	20	7	-	-
Deer	44	39	94 (232)	124 (306)

BROWSE CHARACTERISTICS --

Management unit 21 , Study no: 13

		Age class distribution (plants per acre)					Utilization				
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata tridentata</i>											
85	<b>1866</b>	133	266	1000	600	-	39	14	32	4	23/29
91	<b>1732</b>	-	266	1000	466	-	12	4	27	12	25/32
98	<b>2560</b>	-	40	1960	560	580	2	0	22	7	29/38
03	<b>2060</b>	-	-	1400	660	440	36	5	32	11	30/40
<i>Cowania mexicana stansburiana</i>											
85	<b>466</b>	-	133	333	-	-	57	0	0	0	43/42
91	<b>465</b>	-	66	333	66	-	57	29	14	0	49/45
98	<b>580</b>	40	40	520	20	40	69	0	3	0	62/66
03	<b>520</b>	20	40	240	240	20	19	50	46	4	61/72
<i>Gutierrezia sarothrae</i>											
85	<b>1999</b>	600	266	1733	-	-	0	0	0	0	9/10
91	<b>2866</b>	266	400	2266	200	-	0	0	7	19	11/12
98	<b>2080</b>	80	340	1700	40	120	0	0	2	2	8/11
03	<b>260</b>	-	-	260	-	-	0	0	0	0	8/10
<i>Juniperus osteosperma</i>											
85	<b>800</b>	133	400	400	-	-	0	0	-	8	69/56
91	<b>999</b>	-	666	333	-	-	33	0	-	0	75/49
98	<b>80</b>	-	40	40	-	100	0	0	-	0	-/-
03	<b>100</b>	-	40	60	-	-	0	0	-	0	-/-
<i>Opuntia spp.</i>											
85	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
98	<b>40</b>	-	-	40	-	-	0	0	-	0	7/17
03	<b>0</b>	-	-	-	-	-	0	0	-	0	6/18

		Age class distribution (plants per acre)					Utilization				
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
<b>Purshia tridentata</b>											
85	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
98	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
03	<b>20</b>	-	-	20	-	-	0	100	-	0	8/12
<b>Quercus gambelii</b>											
85	<b>0</b>	66	-	-	-	-	0	0	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
98	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
<b>Rhus trilobata</b>											
85	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
98	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	-	0	55/98